

WHAT IS CLAIMED IS:

1. A guidance system for providing steering control of a swing arm boom assembly for a center pivot irrigation system having a main arm water conduit with one end pivotally connected to a central point of water supply at a known location and supported on at least one movable tower, said system further comprising:

- (a) Said swing arm boom assembly including a water conduit supported by a drive tower having:
 - (1) a generally horizontally aligned cross beam;
 - (2) an upstanding wheel strut assembly located proximate each end of said cross beam;
 - (3) at least one steerable wheel associated with the lower end of each strut assembly;
 - (4) a steering assembly including a steering motor and means operatively connecting said motor to said wheels;
- (b) means for controlling said steering assembly to cause said drive tower to travel along a preselected path of travel, said control means comprising:
 - (1) satellite signal receiving means, including a first GPS receiving antenna rotatably mounted on said swing tower, in a position that is continuously in front of at least one of said steerable wheels such that the position information received by said receiving means from said first antenna reflects locations that said one steerable wheel is moving toward when the drive tower is moving in a forward

direction so that deviations of said swing tower from said predetermined path of travel are minimized; and

- (2) computer means associated with said receiving means to process position information from said receiving means to determine the position of said first antenna with respect to said preselected path of travel and provide an appropriate steering signal as a result thereof.

2. The guidance system as described in claim 1, wherein said first antenna is mounted on said swing tower in such fashion that its rotation is in direct relation to the steering movement of said one steerable wheel.

3. The guidance system as described in claim 1, wherein the movement of said first antenna is on a line of travel parallel to the line of travel of said one steerable wheel.

4. The guidance system as described in claim 1, wherein said receiving means further includes a second GPS receiving antenna mounted on said swing tower in a position to the rear of at least one of said steerable wheels such that the position information received by said receiving means from said second antenna reflects locations that said one steerable wheel is moving toward when the drive tower is moving in a rearward direction so that deviations of said swing tower from said predetermined path of travel are minimized.

5. The guidance system as described in claim 4, wherein said second antenna is mounted on said swing tower in such fashion that its rotation is in a direct

relationship to the steering movement of said one steerable wheel.

6. The guidance system as described in claim 4, wherein said first and second antennas are spaced an equal distance from said one steerable wheel.

7. The guidance system as described in claim 3, wherein said steering assembly further includes steering arms that are pivotally associated with said wheel struts and a tie rod that connects said steering arms together to insure that the steering movements of said steerable wheels are synchronized.

8. The guidance system as described in claim 7, wherein said first antenna is mounted on one of said steering arms.

9. The guidance system as described in claim 3, wherein said computer means produces said steering signal by comparing the actual position of one of said first and second antennas to points located on said preselected path of travel.

10. The guidance system as described in claim 9, wherein said computer means compares the perpendicular distance of said one of said first and second antennas from a line that passes through two points that lie on said preselected path of travel on opposite sides of the actual position of said antenna.